

Note on the Transit of the Earth and Moon across the Sun's Disk as seen from Mars on November 12, 1879, and on some kindred Phenomena. By A. Marth, Esq.

At the meeting of the Society in November last I mentioned that on the day of the next opposition of the planet Mars, the Earth and Moon, as seen from Mars, would cross the Sun's disk, a phenomenon which had not happened since the year 1800, and I stated the chief circumstances connected with the case. The following data will sufficiently indicate the course of the two bodies across the disk :—

INGRESS.			EGRESS.		
1879 Nov. 12. G.M.T. h m	Pos. angle. °		G.M.T. h m	Pos. angle. °	
1 49	125.7	external contact of ☾	9 40	225.3	internal contact of ☾
1 55	126.4	internal „ „	9 46	226.1	external „ „
4 16	123.3	external „ ☿	11 39	225.9	internal „ ☿
4 37	125.9	internal „ „	12 0	228.5	external „ „

The apparent radius of the Sun's disk may be taken to be 650''·5, that of the Earth 18''·1, that of the Moon 4''·9. The position-angles are reckoned from the point of the Sun's disk in the direction of the north pole of the orbit of Mars.

The last occasion when the Earth and Moon crossed the Sun's disk for Mars occurred on November 8, 1800. The two next transits, near the opposite node, will take place at the times of the oppositions in May 1905 and May 1984.

During the last half-century there have been ten transits of Mercury as seen from Mars (against six as seen from the Earth) :

1836 July 27	1856 June 4*
37 Aug. 23*	57 April 15
38 July 3 (very short chord)	66 Sept. 5
47 Jan. 13*	76 Jan. 27
47 Nov. 23	77 Feb. 21*

the four marked with an asterisk being near the descending node, the others near the ascending node of the orbit of Mercury on that of Mars.

Venus has crossed the Sun's disk four times :

1830 May 15	1862 May 15
34 Dec. 27*	66 Dec. 25*

On the other hand, Mars itself has crossed the Sun's disk, as seen from Saturn or Saturn's satellites, 1831, July 25 (short chord), and 1847, July 26. It has been in transit for Uranus and its satellites 1851, July 25, and 1853, June 24 (apparent diameter of Sun 97''·4, of ☿ 0''·5), and for Neptune and its satellite 1860, October 25, and 1862, September 19, (apparent diameter of Sun 64''·4, of ☿ 0''·3). The reason that there have not been more transits for Neptune than for Uranus is found in the cir-

cumstance that the inclination of the orbit of *Mars* to that of *Neptune* is double that of the orbit of *Mars* to that of *Uranus*. Otherwise transits will in general be the more frequent, the further the outer planet is away. There has been no transit of *Mars* for *Jupiter* and *Jupiter's* satellites during the last half-century. The last transit occurred August 13, 1785, the next one will take place, I presume, in April 1886.

Though these statements respecting transits across the Sun's disk, as seen from or occasioned by the planet *Mars*, may possess no direct practical interest, they will perhaps facilitate the formation of correct and distinct notions concerning this class of invisible phenomena, and their communication may therefore not be without interest for some readers.

On the Change in the Mean Error of Longitude of Hansen's Lunar Tables since 1876. By W. T. Lynn, B.A.

At page 12 of his last Annual Report to the Board of Visitors, the Astronomer Royal expressed the opinion that the error of longitude of Hansen's Lunar Tables, instead of continuing to increase as it had done for several years previously, was on the whole somewhat smaller in 1878 than it had been a year or two before. I have put this to the test of figures, by computing the mean error from the Greenwich observations made with both the Transit-Circle and Altazimuth in 1878, and comparing it with that from the observations in 1876, as given in my paper in the *Monthly Notices* for last March (page 369). The Astronomer Royal gives me permission to make public the result from the observations for 1878, which are not yet published, and I am thereby enabled to exhibit the following comparison, proving that the mean error of longitude was in fact then decreasing, as it probably is still :—

1. From Observations with the Transit-Circle—

Year.	No. of Observations.	Mean Error of Longitude for the Year.
1876	82	+ 9 ^{''} 72
1878	90	+ 8 ^{''} 23

2. From Observations with the Altazimuth—

Year.	No. of Observations.	Mean Error of Longitude for the Year.
1876	171	+ 9 ^{''} 31
1878	161	+ 7 ^{''} 48

The sign + indicates, as usual in the *Greenwich Observations*, that the *Nautical Almanac* (Hansen's) place is too large. The largest mean error in the opposite direction was in the year 1862, which is given in my paper above referred to, and amounts to about -3^{''}20 from the mean of the results with the two instruments. From that time it appears to have been affected